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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/856,710 | 02/26/2002 | Benoit Boulanger | 1721-30 | 2996 |

7590 06/10/2003

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EXAMINER

LEE, JOHN D

ART UNIT

PAPER NUMBER

2874

DATE MAILED: 06/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/856,710

Applicant(s)

BOULANGER ET AL.

Examiner

John D. Lee

Art Unit

2874

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 February 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f). All of the required copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

The drawings are objected to because Figure 2 thereof consists of six (6) separate figures which must be individually labeled. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Please note that, regarding the required drawing correction (above), the specification must be amended to correspond to any newly presented drawing changes.

The Examiner hereby makes inquiry as to applicant's entitlement to priority based on French Application Number 97/14947, filed in France on November 27, 1997. It is noted that the French application does not include Figures 10-13 which appear in the present application, and that Figure 9 herein differs from Figure 9 of the French application. Applicant must explain these inconsistencies in order for the claim to foreign priority to be considered valid.

The disclosure is objected to because of the following informalities: the title on page 1 is incorrect ("AT LEAST TUNABLE" should be "TUNABLE AT LEAST"). There are also problems related to the numbering of equations in the specification. On page 25, it is noted that there is no equation (2) – the next equation after (1c) is numbered (3). On page 26, the equation in the middle of the page is unnumbered, but should be identified as equation (4). On pages 27-28, the equations should be individually

identified in the right margin as equations **(5)** through **(11)**. On page 48, it is believed that the equation at the bottom of the page should be identified as equation **(20)**. Appropriate correction is required. Applicant's cooperation is requested in correcting any other errors of which applicant may become aware in the specification.

The numbering of claims is not in accordance with 37 CFR § 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not). In the present case, applicant's preliminary amendment has resulted in there no longer being a claim "28" even though there was no indication of its cancellation. It is assumed that this is an inadvertent error. Original claim 28 will still be considered for examination purposes (below).

Claims 9 (when dependent upon claim 1) and 11 (when dependent upon claim 1) are objected to under 37 CFR § 1.75 as being substantial duplicates of claims 8 and 10, respectively. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k). It is suggested that the dependencies of claims 9 and 11 be changed so that they do not depend from claim 1.

The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-39 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In independent claim 1, in lines 5 and 11, the pronoun "it" is unclear and the claim is thus indefinite. Note the unclear phrases: "it is essentially formed" (what is essentially formed?); "it further comprises" (what further comprises?). Also in independent claim 1, the alternatively recited limitations with respect to the "cylindrical volume of revolution" ("in a complete or a truncated way....or else even in a partial way") are unclear since they do ^{not} seem to set forth any positive limitations, but rather seem to encompass all possibilities. This also makes the claim indefinite. Claims 2-39, all being dependent upon claim 1, inherently contain the same deficiencies and are likewise indefinite. In addition, in line 5 of claim 2, the word "or" should be "and". There are several inaccuracies and inconsistencies in the crystal list of claim 5: " $\beta\text{Ba}_4\text{BO}_4$ " should actually be " $\beta\text{BaB}_2\text{O}_4$ " (see page 8 of the specification); " CsD_2AsO_4 " should actually be " CsD-AsO_4 " (see page 8 of the specification); and " AgGaAsO_2 " should actually be " AgGaSe_2 " (see page 8 of the specification). Also in this crystal list, what is "D" in several of the formulas? The Examiner does not believe "D" represents any element in the periodic table. In claims 6 and 30-33, it is not clear what is meant by "the concavity orientated on the side of said crystal" and "the concavity orientated on the opposite side of said crystal". In line 2 of claim 13, the antecedent reference of the pronoun "they" is unclear (what are accessible?). In line 3 of claim 15, the word "and" should be inserted before "a network". In line 2 of claim 18, the word "or" should be "and". In line 2 of claim 26, the word "and" should be inserted before "a

generation". In the first line of each of claims 34 and 36-38, and in the second line of claim 39, the meaning of the pronoun "it" is unclear. Also, in the last line of claim 38, the word "and" should be inserted before "an optronic".

Claim 28 is objected to under 37 CFR § 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claim has not been further treated on the merits.

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 6, 12-14, 17-27, 29, 30, 38, and 39 are further rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,290,485 to Gotoh et al. Gotoh et al discloses a device for generating (through second-order and third-order nonlinear four-wave parametric interactions) emerging optical radiation which can be tuned in frequency. The Gotoh et al device comprises a nonlinear optical crystal of a particular shape, of which a cylindrical shape is particularly specified (see Figure 3(d) and column 8, last paragraph). The embodiments of this reference which include the cylindrical crystal do not show input and output lenses, as claimed by applicant, but other embodiments do include such input and output lenses (see, for example, column 8, lines 62-67). The inclusion of input and output lenses with the cylindrically shaped crystal embodiment of the Gotoh et al device, then, in order to more accurately get light

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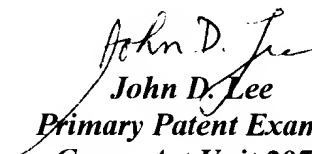
into and out of the crystal, would have been obvious to a person of ordinary skill in the art at the time of applicant's invention. It is believed that the organic crystal materials of the reference are hyperpolarizable and non-centrosymmetric. With respect to the limitations of applicant's claims 12 and 13, the crystal of Gotoh et al would obviously be oriented so as to provide maximum efficiency of all optical interactions therein. Note that the crystal of Gotoh et al can be placed in a resonator (see Figure 1(a) and corresponding description), and it would certainly be obvious to have the input and output lenses (discussed above) placed outside the resonator.

Claims 34-37 are further rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,290,485 to Gotoh et al as applied in the immediately preceding paragraph, in view of U.S. Patent 5,130,996 to Amano et al. Gotoh et al discloses all the limitations of these claims except that there is no thermal or electrical control of the nonlinear crystal. Amano et al, however, shows that thermal and electrical control of a cylindrically shaped nonlinear crystal is well known in the art. The person of ordinary skill in the art would therefore have found it obvious to include such thermal and/or electrical control for the crystal in Gotoh et al.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited references to Hayashi, Bortz et al, Brassart, Sumitomo, and Yokogawa (copies not included with this Office action) represent the prior art that was cited by the PCT Examiner during the prosecution of the corresponding International Application.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103(a), the Examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Examiner to consider the applicability of 35 U.S.C. § 103(c) and potential 35 U.S.C. §§ 102(e), (f) or (g) prior art under 35 U.S.C. § 103(a).

Any inquiry concerning the merits of this communication should be directed to Examiner John D. Lee at telephone number (703) 308-4886. The Examiner's normal work schedule is Tuesday through Friday, 6:30 AM to 5:00 PM. Any inquiry of a general or clerical nature (i.e. a request for a missing form or paper, etc.) should be directed to the Technology Center 2800 receptionist at telephone number (703) 308-0956, to the technical support staff supervisor (Team 2) at telephone number (703) 308-3072, or to the Technology Center 2800 Customer Service Office at telephone number (703) 306-3329.


John D. Lee
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